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The KTY formalism and nonadiabatic contributions to the neutrino oscillation probability

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It is shown that it is possible to obtain the analytical expression for the effective mixing angle in matter using the formalism which was developed by Kimura, Takamura and Yokoyama for the neutrino oscillation probability in matter with constant density. If we assume that the imaginary part of the integral of the difference of the energy eigenvalues of the two levels at each level-crossing is given by the ratio γ of the difference of the energy eigenvalues of the two levels to the derivative of the effective mixing angle at the level-crossing, then the nonadiabatic contribution to the oscillation probability can be expressed analytically by this formalism. We give one example in which the energy eigenvalues cannot be expressed as roots of a quadratic equation and we show that our assumption is correct in the approximation of the small mixing angle. (arXiv:1402.5569)

Summary

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